NOTICE

All drawings located at the end of the document.

CORRES CONTROL
OUTGOING LTR NO

DOE ORDER #

03RF01340

DIST	LTR	ENC
Berardini, Jacqueline	X	
BRAILSFORD, M D		
FERRERA, D W	X	
FERRI, M S		
FULTON, J C		
GIACOMINI, J		
HALL, L		
MARTINEZ, L A		
PARKER, A M		
POWERS, K		
SCOTT, G K		
SHELTON, D C	X	
SPEARS, M S		
TRICE, K D		
VOORHEIS, G M		
BUTLER, J L	X	X
BROUSSARD, M	X	X
COR. CONTROL	X	X
ADMN. RECORD	X	X
WASTE REC. CTR.		
TRAFFIC		
PATS/130		
CLASSIFICATION		
UCNI		
UNCLASSIFIED		
CONFIDENTIAL		
SECRET		

AUTHORIZED CLASSIFIER SIGNATURE
Exemption – CEX-105-01

Date

IN REPLY TO RFP CC NO

ACTION ITEM STATUS

☐ PARTIAL/OPEN

☐ CLOSED

LTR APPROVALS

ORIG & TYPIST INITIALS

1
31

KAISER•HILL COMPANY

September 4, 2003

03-RF-01340

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TRANSMITTAL OF THE NO FURTHER ACCELERATED ACTION JUSTIFICATION FOR THE EAST TRENCHES PAC REFERENCE NUMBERS NE 111 2, NE 111 3, NE 111 5, NE 111 6A, NE 111 6B, NE 111 7 & NE 111 8 – JLB-085-03

Enclosed are copies of the No Further Accelerated Action Justification for the East Trenches PAC Reference Numbers NE 111 2, NE 111 3, NE 111 5, NE 111 6a, NE 111 6b, NE 111 7 & NE 111 8 for your verification and subsequent approval Previous comments have been incorporated as discussed

If you have any questions, please contact me at extension 5245

for J Lane Butler

J Lane Butler
Manager, Environmental Restoration Programs

JLB dm

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Rocky Flats Environmental Technology Site 10808 Hwy 93 Unit B Golden CO 80403-8200 • 303-966-7000

Orig and 1 cc – Richard DiSalvo
cc Norma Castaneda

Enclosures
As Stated

KEF 03-RF-01340, JLB-085-03

NO FURTHER ACCELERATED ACTION JUSTIFICATION FOR THE EAST TRENCHES

PAC REFERENCE NUMBER: NE-111.2, NE-111.3, and NE-111.5 – NE-111.8

IHSS Reference Number NE-111 2, NE-111 3, NE-111 5, NE-111 6a, NE-111 6b, NE-111 7, and NE-111 8
Unit Name Trenches T-5, T-6, and T-8 through T-11 (Trench T-3 through T-13 are collectively known as the East Trenches, however in this document, the six trenches for which a No Further Accelerated Action justification is presented, are collectively referred to as the East Trenches)

Approximate Location N750,000, E2,087,500

Date(s) of Operation or Occurrence

The trenches were used during the period from July 29, 1954, through August 14, 1968, although the exact dates of operation are unknown (Dow 1970a) To date, no documentation has been found that records the timeframe during which any particular trench was receiving waste Similarly, none of the HRR interviewees were knowledgeable on dates of operation of individual trenches Trenches T-9, T-10, and T-11 were differentiated from the other trenches and added to the disposal trench inventory in 1977 (Rockwell 1985)

Description of Operation or Occurrence

Trenches T-2 (900-109) and the East Trenches (T-3 - T-13) were used primarily for the disposal of sanitary wastewater treatment plant sludge (Dow 1970a) The sludge removed from the wastewater treatment plant was placed on sludge drying beds The dried material removed from the sludge drying beds was placed in the disposal trenches The sludge disposed of in these trenches should consist primarily of concentrated organic matter typically present in sanitary wastewater treatment plant sludge The total amount of sludge disposed in Trenches T-2 through T-13 is estimated at 125,000 kilograms (Rockwell 1983) As many as 300 flattened drums may have also been disposed in any of Trenches T-2 through T-11 following burning of contaminated oils that had been held in the drums (Dow 1970b) The burning of the contaminated oils had been done in Oil Burn Pit No-2 (PAC 900-153) from March 1957 to mid-1965 (Dow 1970b), not in the trenches (Dow 1973a) The trenches are variable in length, with the average length being approximately 250 feet (Dow 1971) The trenches are reported to be approximately 10 feet deep and are provided with two feet of soil cover

Some amounts of additional materials were also disposed in Trenches T-4, T-9, and T-11 These other materials consisted of asphalt planking (approximately 130,000 square feet of asphalt planking) in T-4 and T-11 from the re-design of Solar Pond 207A (PAC 000-101) in 1963, and scrap metal and junk in T-9 (Rockwell 1983) An employee was contacted who remembers that Trench T-13 may contain some laboratory waste

At the same time that Trenches T-9, T-10, and T-11 were identified (1977), it appears that the numbering system for the trenches was slightly modified Whereas earlier documents had presented a consistent numbering system, in a 1983 document a trench that had previously been referred to as Trench T-4 became T-11 (Rockwell, 1983) This 1983 document placed the T-4

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Trench essentially as an addition to Trench T-3 (Dow 1970a and Rockwell 1983) This same 1983 document designated Trench T-9 as essentially an extension of Trench T-7 (Rockwell 1983), but in earlier documents this trench had been referred to as Trench T-5 (Dow 1970a) Trench T-10 had not been identified or named prior to 1983 The trench identified as Trench T-5 in the 1983 document was a trench not previously identified (comparison of maps in references Dow, 1970a and 5)

Trenches T-12 (PAC NE-1412) and T-13 (PAC NE-1413) were identified and incorporated into the Remedial Investigation for Operable Unit 2 in June of 1993 when a plant employee completed further research of aerial photographs in the East Trenches area Trench T-13 was visible only in vertical aerial photographs taken on April 15, 1966, and April 29, 1967, and is now covered by the East Access Road (north bypass) 900 feet east of the inner east guard gate Trench T-12 was visible in a July 2, 1955 aerial photograph, and lies south of Trench T-13 beneath the main East Access Road In the Draft Trenches and Mound Site Characterization Report (see Responses to Operation or Occurrence), Trench T-12 is described as an extension of Trench T-9, and the location is shown to be just west of Trench T-9 based on geophysics and visual observations For clarity and administrative purposes, the original location of Trench T-12 (NE-1412) beneath the East Access Road south of Trench T-13 has been retained Trench T-12 which is portrayed in the 1996 Draft Trenches and Mound Site Characterization Report has been renamed IHSS 111 6b (Trench T-9b) Trench T-9 has been renamed IHSS 111 6a (Trench T-9a) Subsurface soil data for both Trench T-9a and T-9b are evaluated in this document

Physical/Chemical Description of Constituents Released

Some uranium and plutonium contamination is present in the sludge disposed in the trenches It is reported that the older sludge would have had primarily uranium contamination with newer sludge having an increasing amount of plutonium contamination (Dow 1970a) Total long-lived alpha activity present in the sludge was reported between a minimum of 382 pCi/g in August 1964 to a maximum of 3,591 pCi/g in June 1960 (Dow 1970a) It was estimated in a 1973 document that Trench T-4 (currently designated Trench T-11 as discussed above) contains 16 2 grams of uranium-235 (Dow 1973b) Uranium contamination may also be present in flattened drums that may have been disposed in any of Trenches T-2 through T-11

On at least one occasion it is believed that 2,400 gallons of water and lathe coolant generated in Building 444 was also disposed in one of the East Trenches This waste had an average activity of 150,000 dpm/l It is believed that this is total alpha activity The activity of this material was reported as 1 35 x 10^8 dpm with approximately 1 3 kilograms (kg) of depleted uranium present in the waste (Dow 1964) It is unknown whether or not this material was in drums

Responses to Operation or Occurrence

Soil samples were collected from the three new trenches identified in 1977 (Trenches T-9, T-10, and T-11) during the 1977 to 1983 time frame Soil from Trench T-9 was found to vary from 0 40 to 68 pCi/g in plutonium activity, and from 2 4 to 450 pCi/g uranium activity Trench T-10 was found to contain from 0 18 to 14 pCi/g plutonium activity and from 40 to 126 pCi/g uranium activity Trench T-11 was found to contain 4 5 to 50 pCi/g plutonium activity and 0 9 to 158 pCi/g in uranium activity (Rockwell 1983)

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In the late 1980s and early 1990s, Phase I and Phase II Resource Conservation and Recovery Act (RCRA) Facility Investigations/Remedial Investigations (RFI/RIs) were conducted in the East Trenches area (a part of Operable Unit 2 at the time) The results are provided in the OU 2 Phase II RFI/RI Report (EG&G 1995a) These investigations did not provide the data necessary to determine dimensions and boundaries of the trenches, or areas of high concentration of contaminants in the trenches For example, while at least one borehole was drilled into each trench, drilling through the trenches was excluded because of the uncertainties in the trench contents, and in whether the area beneath the trenches was contaminated Drilling through the trenches could potentially have created pathways for contaminants to migrate downward into uncontaminated areas

In 1995 and 1996, further investigations of the East Trenches area were conducted in accordance with the Trenches and Mound Site Characterization Work Plan (EG&G 1995) The results of the investigation are provided in the Draft Trenches and Mound Site Characterization Report (RMRS 1996) This investigative program utilized several methodologies to meet project objectives historical data were compiled to identify potential contaminants, trench location and size, aerial photographs were examined to identify disturbed areas, verify trench dimension and determine times of operation, a visual survey was conducted to identify features on the ground and to lay out a geophysical sampling grid, two electromagnetic surveys were conducted to delineate magnetic anomalies and to delineate trench boundaries, Ground Penetrating Radar (GPR) surveys were conducted to better determine trench depth and extent, soil gas surveys were conducted to identify and delineate volatile organic contaminant plumes, and subsurface soil sampling was conducted to verify soil gas survey results and to better define metal and radionuclide contamination present at the sites

Figure 1 shows the locations of the East Trenches based on Trench T-3/T-4 remediation findings, and the results of the Trenches and Mound Site Characterization Note that the trench boundaries are different from the IHSS/PAC boundaries because the remediation activities, and electromagnetic and GPR surveys better defined the trench boundaries (and depths)

Fate of Constituents Released to Environment

The following conclusions were drawn from the Trenches and Mound Site Characterization with respect to the East Trenches (T-5, T-6, and T-8 through T-11) 1) there were no contaminant concentrations in subsurface soil above any RFCA Subsurface Soil Action Levels (those established in RFCA 1996), 2) there were no contaminant plumes in groundwater originating from the trenches and the area at Trenches T-5 through T-9 is often dry, and 3) with no pathway to surface water and without a well defined source, it is recommended that the trenches not be remediated

Given the conclusions drawn from the Trenches and Mound Site Characterization, the East Trenches have been assessed to render a No Further Accelerated Action (NFAA) determination The assessment has been conducted pursuant to recent modifications to RFCA Attachment 5 that were approved June 5, 2003, specifically, the introduction of new Action Levels (ALs) and the integrated risk-based approach (application of the Subsurface Soil Risk Screen) Trench T-3 and T-4 are not included in this analysis because they were previously remediated, and Trench T-7, T-12 and T-13 are not included because they have already been proposed for NFAA

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The East Trenches were extensively sampled as part of the Trenches and Mound Site Characterization and through groundwater monitoring that has been conducted in the area over the past 15 years Table 1 summarizes the boreholes that directly penetrated the East Trenches The borehole locations are depicted on Figures 2 through 8 Data for samples from these borehole have been used in the analysis provided herein The data are summarized in Tables 2 through 8 These tables show analytes that were detected above background (see discussion below) The suites of analyses performed on the samples from each trench are identified in the table notes In these tables, the following decision rules were applied to the calculation of summary statistics

1 Data rejected during validation were eliminated from the data set before computing statistics
2 The maximum value is the highest detected value observed
3 The average was computed using only data that are above background concentrations

Figures 2 through 8 show all the data that were detected above background at least once, and have a Wildlife Refuge Worker Soil Action Level (AL) RFCA ALs (Wildlife Refuge Worker and Ecological Receptor) are from RFCA Attachment 5, dated June 5, 2003 Background levels for inorganic constituents for subsurface soil are from the Background Geochemical Characterization Report (DOE 1993) All background values used for comparison are the mean background value plus two standard deviations Any detection of an organic compound is considered an above background level observation

SURFACE SOIL ASSESSMENT

Surface soil in the area of the East Trenches contains above background levels of plutonium and americium resulting from the historical release and wind dispersal of these radionuclides from the 903 Pad The need for, and extent of, any surface soil remediation in this area will be addressed in the 903 Lip Area and Americium Zone Interim Measure/Interim Remedial Action

APPLICATION OF THE SUBSURFACE SOIL RISK SCREEN

Screen 1 – Are Contaminant of Concern (COC) Concentrations Below Table 3 Wildlife Refuge Worker (WRW) Soil Action Levels?

No Two samples from Trench T-8 contained plutonium-239,240 at concentrations exceeding the AL of 50 pCi/g (Table 4 and Figure 4) The samples are the 3 to 8 foot interval and 8 to 10 foot interval for borehole 12795 The maximum plutonium-239,240 concentration was 642 pCi/g The americum-241 concentration in the 3 to 8 foot interval (105 pCi/g) also exceeded the AL of 76 pCi/g No other samples from this trench or from any other trench had analyte concentrations that excced the Wildlife Refuge Worker ALs

Screen 2 – Is there potential for subsurface soil to become surface soil?

No The East Trenches are not in an area prone to landslides as shown in the attached Figure 9[1]

Screen 3 – Does subsurface soil radiological contamination exceed criteria in Section 5.3 and Attachment 14?

No ALF Section 5 3(C)(2) requires the removal of soil in the 3-6 foot depth interval that contains plutonium at concentrations that exceed 3 nCi/g with an areal extent of contamination

[1] Ref Figure 1 of RFCA Attachment 5

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that exceeds 80m^2 As shown on Figure 4, plutonium concentrations did not exceed 3 nCi/g in any of the Trench T-8 waste samples Concentrations of plutonium (and americium) are significantly lower than the 3nCi/g limit Also, concentrations of plutonium and americium did not exceed the Wildlife Refuge Worker ALs in any other samples in this trench or any other trench considered in this evaluation

Screen 4 – Is there an environmental pathway and sufficient quantity of COC that would cause exceedance of surface water standards (SWS)?

No Contaminant migration via erosion and groundwater are the two possible pathways whereby surface water could become contaminated by the East Trenches However erosion is an insignificant pathway because the East Trenches are in a flat-lying area not prone to erosion, and the waste material is covered with 2 feet of soil

With respect to the groundwater pathway, Trenches T-5 through T-9a and T-9b are located near to a hydraulic divide where water may migrate to the northeast or to the southeast depending on groundwater levels (Figure 10) Most of the time, the wells in the vicinity of Trenches T-5 through T-9 are dry When there was sufficient groundwater in the area for sampling, concentrations of volatile organic compounds (VOCs) have been very low, and on the average, are not at concentrations that exceed the Safe Drinking Water Act Maximum Contaminant Levels (MCLs) With respect to uranium, a sample from well 07991 was collected and analyzed for uranium-235, uranium-236, and uranium-238 using Inductively Coupled Plasma/Mass Spectrometry (ICP/MS) as part of a joint CDPHE/RFETS program to determine where uranium is naturally occurring on Site The results for the well 07991 sample indicate a uranium-238 concentrations of 25 3 pCi/l, and a U235/U238 ratio of 0 0063, which is indicative of the presence of depleted uranium (natural uranium has a U235/U238 ratio of 0 0072) The sample also contained uranium-236, which is a fission product and is not a naturally occurring isotope Although the uranium-238 concentration exceeds the Woman Creek surface water AL of 11 pCi/l, the concentration is below the Site background concentration for the Upper Hydrostratigraphic Unit of 66 3 pCi/l Also, the subsurface soil results do not indicate there is a depleted uranium source for the contamination Therefore, neither a sufficient quantity of uranium (or VOCs) in the trenches, nor a sufficient quantity of groundwater beneath the trenches, appears to exist to cause an exceedance of the surface water AL

In contrast to Trenches T-5 through T-9a and T9b, groundwater is usually present at Trenches T-10 and T-11, and the groundwater flow is to the northeast (Figure 10) There is considerable VOC contamination in the groundwater some or most of which appears to have originated from other sources to the southwest of the trenches Because VOCs are largely absent in the waste material in Trenches T-10 and T-11, it does not appear the trenches are a source for groundwater contamination Regardless, any contaminants released to groundwater at these trenches would be captured by the East Trenches Plume Groundwater Collection and Treatment System This zero-valence iron treatment system is effective in the removal of VOCs

Screen 5 – Are COC concentrations above Table 3 Action Levels for ecological receptors?

Yes Of all the samples that were collected from the East Trenches, only two had an analyte concentration that exceeded the ecological receptor ALs One sample was the 3 to 6 foot interval from borehole 12495 at Trench T-9a (see Table 5 and Figure 5), and the other sample was the 3 to 5 foot interval from borehole 10295 at Trench T-10 (see Table 7 and Figure 7) In both cases

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the analyte exceeding the ecological receptor AL was lead, and the concentrations of lead were just above the AL The lead AL of 25 6 mg/kg is based on protection of the American Kestrel Because the American Kestrel, a bird of prey would not be directly exposed to the buried material, Preliminary Remediation Goals (PRGs) for other ecological receptors were examined[2] The PRGs for protection of the prairie dog and Preble's Meadow Jumping Mouse (PMJM) are 149 mg/kg and 642 mg/kg, respectively Because the low concentrations of lead relative to these PRGs, it is concluded for the NFAA that there is no threat posed to ecological receptors by the East Trenches[3]

Stewardship Analysis

Application of the Soil Risk Screen to the East Trenches indicates No Further Accelerated Action (NFAA) is necessary for protection of public health and environment However, because subsurface soil at a few of these PACs has contaminant concentrations that exceed Wildlife Refuge Worker or Ecological Receptor soil ALs, both near-term and long-term stewardship actions have been recommended[4] They are discussed below

Near-Term Management Recommendations

Near-term recommendations for environmental stewardship include the following

- Excavation at the sites will continue to be controlled through the Site Soil Disturbance Permit process, and
- Site access and security controls will remain in place pending implementation of long-term controls

Long-Term Stewardship Recommendations

Based on remaining environmental conditions at the East Trenches, no specific long-term stewardship activities are recommended beyond the generally applicable Site requirements that may be imposed on this area in the future, which are dependent upon the final remedy selected Institutional controls that will be used as appropriate for this area include the following

- Prohibitions on construction of buildings,
- Restrictions on excavation or other soil disturbance, and
- Prohibitions on groundwater pumping in the area of the East Trenches

These specific long-term stewardship recommendations will also be summarized in the Rocky Flats *Long Term Stewardship Strategy* No engineered controls, environmental monitoring, or physical controls (e g , fences) are recommended as a result of the conditions remaining at the East Trenches

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[2] The AL is the lowest PRG above Site background levels that was calculated for each of the five selected wildlife receptors judged to be representative of species at RFETS Preble's meadow jumping mouse and black tailed prairie dog (fossorial [burrowing] small mammals), mourning dove (small ground-feeding bird), terrestrial invertebrate (multiple species), and American kestrel (avian predator)

[3] At this time, ecological ALs are not available for all receptors/chemical combinations, however, draft ALs are available for a small subset of chemicals Screen 5 currently evaluates only this subset Risk to ecological receptors will be readdressed through the ecological risk assessment portion of the Comprehensive Risk Assessment (CRA)

[4] The area of trenches T-5, T-6, and T-8 through T-11 is contiguous with the other trenches (T-3, T-4, T-7, T12, and T-13), some of which contain subsurface soil contaminant concentrations that exceed Wildlife Refuge Worker soil ALs Therefore, there would be no reduction in the area requiring near-term and long-term stewardship actions if the subsurface soil in any of trenches T-5, T-6, and T-8 through T-11 were removed

The East Trenches will be evaluated as part of the Sitewide Comprehensive Risk Assessment, which is part of the RCRA Facility Investigation/Remedial Investigation (RFI/RI) and Corrective Measures Study/Feasibility Study (CMS/FS) that will be conducted for the Site The need for and extent of any, more general, long-term stewardship activities will also be analyzed in RFI/RI and CMS/FS and will be proposed as part of the preferred alternative in the Proposed Plan for the Site Institutional controls and other long-term stewardship requirements for Rocky Flats will ultimately be contained in the Corrective Action Decision/Record of Decision, in any post-closure Colorado Hazardous Waste Act permit that may be required, and in any post-RFCA agreement

NFAA Summary

The East Trenches, specifically trenches T-5, T-6, and T-8 through T-11, are proposed for NFAA The Subsurface Soil Risk Screen and ALs in RFCA Attachment 5 dated 6/5/03 have been applied to these PACs The risk screen shows no potential adverse risk to a wildlife refuge worker or ecological receptor Plutonium is present in the buried waste at a maximum concentration of 642 pCi/g, which is well below the 3 nCi/g limit that triggers further evaluation and potential soil removal There is little potential for contaminated runoff because the sites are located in a relatively flat area and the waste is buried The VOC concentrations in the East Trenches waste material is very low, and accordingly, the trenches do not appear to be sources for groundwater contamination The dry conditions at Trench T-5 through T-9a and T-9b will substantially limit any contaminant migration via groundwater At trenches T-10 and T-11, contaminants in groundwater, most if not all of which appear to originate from other sources, are migrating to the north and will be captured by the East Trenches Passive Reactive Barrier system Only two samples from all of the trenches had a contaminant concentration (lead) exceeding an ecological receptor AL However, the AL for lead was established for protection of the American Kestrel, which would not be exposed to the buried material Comparison of the lead concentrations to other ecological-based PRGs for burrowing animals shows that the concentrations of lead in the trench are of no ecological concern Therefore, no further accelerated action is required for the East Trenches

References

DOE 1993a, *Background Geochemical Characterization Report,* Golden, CO, September

Dow, 1964 Employee notes dated 12-14-64 and 12-15-64 Dow Chemical Company

Dow, 1970a *A Summary of On Site Radioactive Waste Disposal,* E A Putzier, Dow Chemical Company, April 22, 1970

Dow, 1970b *Summary of Contaminated Waste Storage Burial at the Rocky Flats Plant Site,* transmitted to Myron C Waddell (Colorado Health Planning Council) by Martin B Biles, Director of Division of Operational Safety, December 22, 1970

Dow, 1971 Aerial Photo dated August 6, 1971 Dow Chemical Company

Dow, 1973a Response to F Gillies Questions, Notes by J F Willging, Dow Chemical Company

Dow, 1973b Monthly Status Report – Health Physics Operations, Technical and Construction - November, 1973, E A Putzier, Dow Chemical Company

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EG&G, 1995 *Trenches and Mound Site Characterization Work Plan*

Rockwell, 1983 *Environmental Inventory, Updated Information on Burial Sites at Rocky Flats*, EA-321-83-240, C T Illsley, Rockwell International, January 28,1983

Rockwell, 1985 Attachment 1 - *Rocky Flats Plant Past Disposal Site*, RFP Revised Part A Permit Application, Rockwell International

RMRS, 1996 *Draft Trenches and Mound Site Characterization Report*, September 1996

Table 1- Subsurface Soil Sampling Locations within the Trench Boundaries

IHSS/PAC Number	Borehole
T-5 (NE-111 2)	11495, 11595
T-6 (NE-111 3)	11695, 11795
T-8 (NE-111 5)	12795, 12895
T-9a (NE-111 6a)	12295, 12395, 12495
T-9b (NE-111 6b)	12595, 12695, 07991
T-10 (NE-111 7)	10195, 10295, 10395, 10495
T-11 (NE-111 8)	11095, 11195, 10491, 07891

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Table 2 Summary of Contaminant Concentrations at Trench T-5

Metal	Cadmium	4	50 00%	16 1	20 8	1 61	962	-	mg/kg
Radionuclide	Americium-241	4	50 00%	1 9	2 092	0 023	76	1900	pci/g
Radionuclide	Plutonium-239/240	4	50 00%	12 65	14 12	0 066	50	3800	pci/g
VOC	1,1,1-Trichloroethane	5	20 00%	29	29	-	79700000	-	ug/kg
VOC	Acetone	5	40 00%	63	86	-	102000000	211000	ug/kg
VOC	Benzene	5	20 00%	2	2	-	205000	-	ug/kg
VOC	Ethylbenzene	5	20 00%	62	62	-	4250000	-	ug/kg
VOC	Methylene chloride	5	100 00%	76 2	330	-	2530000	39500	ug/kg
VOC	Naphthalene	4	25 00%	5900	5900	-	3090000	-	ug/kg
VOC	Tetrachloroethene	5	80 00%	331	710	-	615000	37500	ug/kg
VOC	Toluene	5	60 00%	18	26	-	31300000	128000	ug/kg
VOC	Trichloroethene	5	60 00%	861	1600	-	19600	509000	ug/kg
VOC	Xylene	5	40 00%	195	370	-	2040000	-	ug/kg
SVOC	2-Methylnaphthalene	4	25 00%	26000	26000	-	20400000	-	ug/kg
SVOC	Acenaphthene	4	25 00%	2000	2000	-	40800000	-	ug/kg
SVOC	Anthracene	4	25 00%	1600	1600	-	204000000	-	ug/kg
SVOC	Benzo(a)anthracene	4	50 00%	465	600	-	34900	800000	ug/kg
SVOC	Benzo(a)pyrene	4	75 00%	697	1100	-	3490	25700	ug/kg
SVOC	Benzo(b)fluoranthene	4	50 00%	880	1400	-	34900	1010000	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	4	25 00%	460	460	-	1970000	-	ug/kg
SVOC	Butylbenzylphthalate	4	25 00%	35	35	-	147000000	-	ug/kg
SVOC	Chrysene	4	75 00%	820	1100	-	3490000	-	ug/kg
SVOC	Fluoranthene	4	50 00%	990	1100	-	27200000	-	ug/kg
SVOC	Fluorene	4	25 00%	3200	3200	-	40800000	-	ug/kg
SVOC	n-Nitrosodiphenylamine	4	25 00%	2400	2400	-	7810000	-	ug/kg
SVOC	Phenol	4	75 00%	1050	1700	-	613000000	-	ug/kg

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Analyte Group	Analyte	Total Number of Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Maximum Value	Wildlife Refuge Worker Action Level	Preliminary Remediation Goal for Soil	Unit
SVOC	Pyrene	4	75 00%	2213	3500	-	22100000	-	ug/kg

Note Analytes shown are those that were detected at least once above background levels and have a Wildlife Refuge Worker Action Level Subsurface soil samples were analyzed for Target Analyte List (TAL) metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, plutonium-239,240, and Target Compound List Volatile Organic Compounds and Semi-Volatile Organic Compounds

[1]SD – Standard Deviation

Above AL

Table 3 Summary of Contaminant Concentrations at Trench T-6

Analyte Group	Analyte	Total Number of Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD[1]	Wildlife Refuge Worker Action Level	[illegible]	Unit
Radionuclide	Americium-241	4	25 00%	0 033	0 033	0 023	76	1900	pci/g
Radionuclide	Plutonium-239/240	4	50 00%	0 176	0 248	0 066	50	3800	pci/g
Radionuclide	Uranium-234	4	25 00%	6 93	6 93	2 25	300	1800	pci/g
Radionuclide	Uranium-235	4	25 00%	0 232	0 232	0 094	8	1900	pci/g
VOC	Acetone	4	75 00%	10 3	15	-	102000000	211000	ug/kg
VOC	Methylene chloride	4	100 00%	5 5	6	-	2530000	39500	ug/kg
SVOC	2-Chlorophenol	4	25 00%	46	46	-	5110000	-	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	4	100 00%	80 5	130	-	1970000	-	ug/kg
SVOC	Butylbenzylphthalate	4	25 00%	43	43	-	147000000	-	ug/kg
SVOC	Phenol	4	100 00%	345	490	-	613000000	-	ug/kg

Note Analytes shown are those that were detected at least once above background levels and have a Wildlife Refuge Worker Action Level Subsurface soil samples were analyzed for Target Analyte List (TAL) metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, plutonium-239,240, and Target Compound List Volatile Organic Compounds, Semi-Volatile Organic Compounds, and Pesticides

[1]SD – Standard Deviation

Above AL

Table 4 Summary of Contaminant Concentrations at Trench T-8

Analyte group	Analyte	Total Number of Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Value Plus 2SD	Wildlife Refuge Worker Action Level	Biological Receptor Action Level	Unit
Metal	Antimony	4	25 00%	91 3	91 3	-	409	-	mg/kg
Metal	Cadmium	4	50 00%	2 9	2 9	1 61	962	-	mg/kg
Metal	Copper	4	25 00%	157	157	18 06	40900	-	mg/kg
Metal	Iron	4	25 00%	152000	152000	18037	307000	-	mg/kg
Metal	Molybdenum	4	25 00%	1970	1970	-	5110	-	mg/kg
Metal	Nickel	4	50 00%	298 5	450	14 9	20400	-	mg/kg
Metal	Silver	4	25 00%	25 9	25 9	-	5110	-	mg/kg
Radionuclide	Americium-241	4	50 00%	0	0	0 022	76	1900	pci/g
Radionuclide	Plutonium-239/240	4	50 00%	2 58	63	0 066	50	3800	pci/g
Radionuclide	Uranium-234	4	100 00%	4 90	9 38	2 25	300	1800	pci/g
Radionuclide	Uranium-235	4	50 00%	0 266	0 375	0 0939	8	1900	pci/g
VOC	Acetone	4	75 00%	16	24	-	102000000	211000	ug/kg
VOC	Methylene chloride	4	50 00%	1 5	9	-	2530000	39500	ug/kg
SVOC	Benzo(b)fluoranthene	4	25 00%	86	86	-	34900	1010000	ug/kg
SVOC	Benzoic Acid	4	25 00%	270	270	-	1000000000	-	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	4	50 00%	52	59	-	1970000	-	ug/kg
SVOC	Chrysene	4	25 00%	100	100	-	3490000	-	ug/kg
SVOC	Fluoranthene	4	25 00%	160	160	-	27200000	-	ug/kg
SVOC	Phenol	4	100 00%	685	1300	-	613000000	-	ug/kg
SVOC	Pyrene	4	25 00%	160	160	-	22100000	-	ug/kg

Note Analytes shown are those that were detected at least once above background levels and have a Wildlife Refuge Worker Action Level Subsurface soil samples were analyzed for Target Analyte List (TAL) metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, plutonium-239,240, and Target Compound List Volatile Organic Compounds and Semi-Volatile Organic Compounds, and Pesticides

[1]SD – Standard Deviation

Above AL

Table 5 Summary of Contaminant Concentrations at Trench T-9a

Analyte Group	Analyte	Total Number Sample Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Metal	Cadmium	6	16 67%	2 4	2 4	1 61	962	-	mg/kg
Metal	Copper	6	16 67%	79 7	79 7	18 06	40900	-	mg/kg
Metal	Lead	6	16 67%	39 5	39 5	54 6	1000	25 6	mg/kg
Metal	Silver	6	16 67%	219	219	-	5110	-	mg/kg
Metal	Zinc	6	16 67%	143	143	73 8	307000	-	mg/kg
Radionuclide	Americium-241	6	16 67%	0 022	0 0218	0 023	76	1900	pci/g
Radionuclide	Plutonium-239/240	6	50 00%	0 081	0 0998	0 066	50	3800	pci/g
Radionuclide	Uranium-234	6	16 67%	9 62	9 62	2 25	300	1800	pci/g
Radionuclide	Uranium-235	6	16 67%	0 342	0 342	0 0939	8	1900	pci/g
Radionuclide	Uranium-238	6	16 67%	10 3	10 26	2	351	1600	pci/g
VOC	1,1,1-Trichloroethane	6	33 33%	151	300	-	79700000	-	ug/kg
VOC	Acetone	6	50 00%	378	1100	-	102000000	211000	ug/kg
VOC	Chloroform	6	16 67%	2	2	-	19200	101000	ug/kg
VOC	Methylene chloride	6	16 67%	3	3	-	2530000	39500	ug/kg
VOC	Naphthalene	8	12 50%	110	110	-	3090000	-	ug/kg
VOC	Tetrachloroethene	6	33 33%	8025	16000	-	615000	37500	ug/kg
VOC	Trichloroethene	6	33 33%	160	190	-	19600	509000	ug/kg
SVOC	Acenaphthene	8	12 50%	160	160	-	40800000	-	ug/kg
SVOC	Anthracene	8	12 50%	190	190	-	204000000	-	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	8	37 50%	47033	71000	-	1970000	-	ug/kg
SVOC	Butylbenzylphthalate	8	50 00%	2925	6100	-	147000000	-	ug/kg
SVOC	Chrysene	8	25 00%	205	370	-	3490000	-	ug/kg
SVOC	Fluoranthene	8	12 50%	430	430	-	27200000	-	ug/kg
SVOC	Fluorene	8	12 50%	120	120	-	40800000	-	ug/kg
SVOC	Phenol	8	75 00%	617	1300	-	613000000	-	ug/kg

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Analyte Group	Analyte	Total Number Sample Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
SVOC	Pyrene	8	25 00%	645	1200	-	22100000	-	ug/kg

Note Analytes shown are those that were detected at least once above background levels and have a Wildlife Refuge Worker Action Level Subsurface soil samples were analyzed for Target Analyte List (TAL) metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, plutonium-239,240, and Target Compound List Volatile Organic Compounds, and Semi-Volatile Organic Compounds

[1]SD – Standard Deviation

[illegible] Above AL

Table 6 Summary of Contaminant Concentrations at Trench T-9b

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Metal	Nickel	4	25 00%	116	116	14 9	20400	-	mg/kg
VOC	Acetone	4	25 00%	6	6	-	102000000	211000	ug/kg
VOC	Trichloroethene	4	50 00%	3	5	-	19600	509000	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	4	75 00%	109	180	-	1970000	-	ug/kg
SVOC	Butylbenzylphthalate	4	100 00%	109	140	-	147000000	-	ug/kg
SVOC	Di-n-butylphthalate	4	25 00%	50	50	-	73700000	-	ug/kg
SVOC	Phenol	4	100 00%	858	1100	-	613000000	-	ug/kg

Note Analytes shown are those that were detected at least once above background levels and have a Wildlife Refuge Worker Action Level No analytes exceeded the Ecological Action Levels Subsurface soil samples were analyzed for Target Analyte List (TAL) metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, plutonium-239,240, and Target Compound List Volatile Organic Compounds and Semi-Volatile Organic Compounds

[1]SD – Standard Deviation

Above AL

Table 7 Summary of Contaminant Concentrations at Trench T-10

Metal	Arsenic	8	12 50%	15 9	15 9	10 1	22 2	21 6	mg/kg
Metal	Lead	8	12 50%	25 2	25 2	5 46	1000	25 6	mg/kg
Radionuclide	Americium-241	8	25 00%	3 85	7 67	0 0227	76	1900	pci/g
Radionuclide	Plutonium-239/240	8	50 00%	8 76	34 8	0 066	50	3800	pci/g
Radionuclide	Uranium-238	8	12 50%	2 67	2 67	2	351	1600	pci/g
VOC	1,1,1-Trichloroethane	9	11 11%	7	7	-	79700000	-	ug/kg
VOC	Acetone	9	100 00%	19 9	48	-	102000000	211000	ug/kg
VOC	Carbon Tetrachloride	9	11 11%	19	19	-	81500	83200	ug/kg
VOC	Chloroform	9	11 11%	5	5	-	19200	101000	ug/kg
VOC	Methylene chloride	9	66 67%	10 17	41	-	2530000	39500	ug/kg
VOC	Tetrachloroethene	9	22 22%	207	410	-	615000	37500	ug/kg
VOC	Toluene	9	33 33%	4 67	10	-	31300000	128000	ug/kg
VOC	Trichloroethene	9	22 22%	7 5	11	-	19600	509000	ug/kg
SVOC	Benzo(a)anthracene	10	30 00%	1500	1800	-	34900	800000	ug/kg
SVOC	Benzo(a)pyrene	10	30 00%	7467	11000	-	3490	25700	ug/kg
SVOC	Benzo(b)fluoranthene	10	10 00%	2800	2800	-	34900	1010000	ug/kg
SVOC	Benzoic Acid	10	40 00%	202	300	-	1000000000	-	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	10	50 00%	58 8	120	-	1970000	-	ug/kg
SVOC	Butylbenzylphthalate	10	70 00%	656	3000	-	147000000	-	ug/kg
SVOC	Chrysene	10	30 00%	2967	3400	-	3490000	-	ug/kg
SVOC	Di-n-butylphthalate	10	40 00%	53 5	83	-	73700000	-	ug/kg
SVOC	Diethylphthalate	10	10 00%	56	56	-	590000000	-	ug/kg
SVOC	Fluoranthene	10	10 00%	450	450	-	27200000	-	ug/kg
SVOC	Indeno(1,2,3-cd)pyrene	10	10 00%	1100	1100	-	34900	-	ug/kg
SVOC	n-Nitrosodiphenylamine	10	10 00%	870	870	-	7810000	-	ug/kg
SVOC	Phenol	10	60 00%	1375	2000	-	613000000	-	ug/kg

Analyte Group	Analyte	Total Number Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD [1]	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
SVOC	Pyrene	10	30 00%	7100	12000	-	22100000	-	ug/kg

Note Analytes shown are those that were detected at least once above background levels and have a Wildlife Refuge Worker Action Level Subsurface soil samples were analyzed for Target Analyte List (TAL) metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, plutonium-239,240, and Target Compound List Volatile Organic Compounds, Semi-Volatile Organic Compounds, and PCBs

[1]SD – Standard Deviation

Above AL

12

Table 8 Summary of Contaminant Concentrations at Trench T-11

Analyte Group	Analyte	Total Number of Samples Analyzed	Detection Frequency	Average Concentration	Maximum Concentration	Background Mean Plus 2SD	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Unit
Metal	Nickel	15	13 33%	134	163	14 91	20400	-	mg/kg
Radionuclide	Americium-241	15	33 33%	0 0342	0 0494	0 0227	76	1900	pci/g
Radionuclide	Plutonium-239/240	15	60 00%	0 0974	0 263	0 066	50	3800	pci/g
VOC	1,2-Dichloroethene (total)	15	6 67%	2	2	-	9200000	-	ug/kg
VOC	4-Methyl-2-pentanone	19	5 26%	2	2	-	16400000	-	ug/kg
VOC	Acetone	19	21 05%	19 2	28	-	102000000	211000	ug/kg
VOC	Carbon Tetrachloride	19	5 26%	3	3	-	81500	83200	ug/kg
VOC	Chloroform	19	5 26%	2	2	-	19200	101000	ug/kg
VOC	Methylene chloride	19	10 53%	4	6	-	2530000	39500	ug/kg
VOC	Tetrachloroethene	19	10 53%	4	4	-	615000	37500	ug/kg
VOC	Toluene	19	26 32%	131	610	-	31300000	128000	ug/kg
SVOC	Benzoic Acid	13	15 38%	146	230	-	1000000000	-	ug/kg
SVOC	bis(2-Ethylhexyl)phthalate	13	38 46%	75 2	110	-	1970000	-	ug/kg
SVOC	Butylbenzylphthalate	13	30 77%	102 2	140	-	147000000	-	ug/kg
SVOC	Di-n-butylphthalate	13	7 69%	56	56	-	73700000	-	ug/kg
SVOC	Diethylphthalate	13	7 69%	160	160	-	590000000	-	ug/kg
SVOC	Phenol	13	23 08%	420	550	-	613000000	-	ug/kg

Note Analytes shown are those that were detected at least once above background levels and have a Wildlife Refuge Worker Action Level Subsurface soil samples were analyzed for Target Analyte List (TAL) metals, gross alpha and beta, uranium-233,234, uranium-235, uranium-238, americium-241, plutonium-239,240, and Target Compound List Volatile Organic Compounds, Semi-Volatile Organic Compounds, and Pesticides

[1]SD – Standard Deviation

Above AL

Trench T-4
111 1
110 Trench T-3
111 7
Trench T 10
111.8
Trench T 11
NE-1413
Trench T-13
Trench T-9c
111 6a
Trench T-9b
111.6b
Trench T 5
111.2
Trench T 6
111 3
Trench T 7
111 4
Trench T-8
111 5
108
Trench 1
NE 1412
903 Pad
112
109
Ryan Pit

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Figure 1

East Trenches Location Map

EXPLANATION

Trench Boundary

IHSS/PAC Boundary

Standard Map Features

Buildings and other structures

Demolished buildings and Other Structures

Paved roads

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other features from 1994 aerial flyover data as captured by EG&G RSL, Las Vegas. Digitized from hardcopy graphs. 1/ 5

NORTH

Scale = 1 2290
1 inch represents approximately 191 feet

0 0 100 200

State Plane Coordinate Projection
Colorado Central ZONE
Datum NAD27

U S Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by
CH2MHILL

Prepared for
KAISER-HILL

September 04 2003

NTS /p1 /fy2 3/3 478/ 2 hml

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
M hyl ne chlonde	3	8	330	ug/kg	5	530000	39500	
T chloroethene	3	8	980	ug/kg	5	19600	509000	
Methylene chlonde	3	8	35	g/kg	5	_530000	39500	
T chloroethen	3	8	1600	ug/kg	5	19600	509000	
Tetrachloroethen	3	8	570	ug/kg	5	615000	37500	
Methylene chlonde	8	10	5	ug/kg	5	530000	39500	
Tetrachloroethen	3	8	710	ug/kg	5	615000	37500	
Aceton	3	8	86	ug/kg	100	107000000	11000	
1 1 1 T chloroethane	3	8	9	ug/kg	5	79700000		
Tol en	3	8	26	ug/kg	5	31300000	1 8000	
Xylene	3	8	0	ug/kg	5	1000000000		
Phenol	8	10	710	ug/kg	330	613000000		
Chrysen	3	8	1000	ug/kg	330	3490000		
Benzo(b)fluoran hen	3	8	1400	ug/kg	330	34900	1010000	
Benzo( )pyren	3	8	1100	ug/kg	330	3490	5700	
Pyrene	3	8	3500	ug/kg	330	72100000		
Phenol	3	8	1700	g/kg	330	613000000		
Benzo( )anthracen	3	8	600	g/kg	330	34900	800000	
b s(Ethylhexyl)ph hal te	3	8	460	ug/kg	330	1970000		
Fluoranthene	3	8	1100	ug/kg	330	7?00000		
Butylbenzylph halate	8	10	35	ug/kg	330	147000000		
Cadmium	3	8	11 4	mg/kg	1	96		1 7
Chromium VI	3	8	18 3	mg/kg		68		
Chromium VI	8	10	16 3	mg/kg		68		
Pluton um- 39/?40	3	8	11 18	pCi/g	0 0 94	50	3800	0 0?
Ameri um- 41	3	8	1 765	pCi/g	0 0578	76	1900	0 0?

111 2

11595

Trench T 5

11495

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Methylene chloride	3	6	6	ug/kg	5	2530000	39500	
Tetrachloroethene	3	6	38	ug/kg	5	615000	37500	
Trichloroethene	8	10	4	ug/kg	5	19600	509000	
Benzene	8	10	2	ug/kg	5	205000		
Tetrachloroethene	8	10	6	ug/kg	5	615000	37500	
Toluene	8	10	21	ug/kg	5	31300000	128000	
Ethylbenzene	8	10	62	ug/kg	5	4250000		
Toluene	3	6	7	ug/kg	5	31300000	128000	
Methylene chloride	8	10	5	ug/kg	5	2530000	39500	
Acetone	8	10	40	ug/kg	100	102000000	211000	
Xylene	8	10	370	ug/kg	5	1E+09		
Chrysene	8	10	1100	ug/kg	330	3490000		
Pyrene	8	10	2400	ug/kg	330	22100000		
Fluorene	8	10	3200	ug/kg	330	40800000		
2 Methylnaphthalene	8	10	26000	ug/kg	330	20400000		
Benzo(b)fluoranthene	3	6	360	ug/kg	330	34900	1010000	
Benzo( )anthracene	3	6	330	ug/kg	330	34900	800000	
Chrysene	3	6	360	ug/kg	330	3490000		
Benzo(a)pyrene	3	6	330	ug/kg	330	3490	25700	
Fluoranthene	3	6	880	ug/kg	330	27200000		
Pyrene	3	6	740	ug/kg	330	22100000		
Benzo(a)pyrene	8	10	660	ug/kg	330	3490	25700	
n-Nitrosodiphenylamine	8	10	2400	ug/kg	330	7810000		
Anthracene	8	10	1600	ug/kg	330	204000000		
Acenaphthene	8	10	2000	ug/kg	330	40800000		
Naphthalene	8	10	5900	ug/kg	330	3090000		
Phenol	8	10	740	ug/kg	330	613000000		
Plutonium-239/240	3	6	14.12	pCi/g	0.00306	50	3800	0.02
Americium-241	3	6	2.092	pCi/g	0.00712	76	1900	0.02
Cadmium	3	6	20.8	mg/kg	1	962		1 7
Chromium VI	3	6	39	mg/kg	2	268		
Chromium VI	8	10	19 6	mg/kg	2	268		

Rocky Fl ts Environmental Techn logy Sit

Figure 2
Trench T-5
Analyte Detections Above Background Levels

EXPLANATION

Boreholes

Trench Boundary

IHSS Boundary

DATA SOURCE BASE FEATURES:
Buildings, ences, hydrography, roads and ther tru res from 99 aerial fly-over data ap red by EG&G RSL, Las Vegas. Digi ed from th or hopho graphs. 1/95

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Datum NAD27

U S Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:
CH2MHILL

Prepared for:
KAISER HILL

September 03, 2003

NTS /p j /hy2 3/0 76/ 2 h6 ml

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
-Chlorophenol	8	10	46	g/kg	330	5110000		
Acetone	3	6	15	ug/kg	100	102000000	11000	
bis(Ethylhexyl)phthal t	3	6	130	ug/kg	330	1970000		
bis(Ethylhexyl)phthal	8	10	46	ug/kg	330	1970000		
Methylene chlonde	3	6	6	ug/kg	5	_530000	39500	
Methylene hlonde	8	10	5	g/kg	5	_530000	39500	
Phenol	3	6	340	ug/kg	330	613000000		
Phenol	8	10	490	ug/kg	330	613000000		
Uranium _34	8	10	6 93	pCv/g	0 0059	300	1800	64
Pluton um 39/240	8	10	0 1034	pCv/g	0 01 3	50	3800	0 0
Ameri um- 41	3	6	0 03 99	pCv/g	0 0065	76	1900	0 0
Uranium-_35	8	10	0 _3 4	pCv/g	0 01 3	8	1900	0 1
Pluton um 39/ 40	3	6	0 48	pCv/g	0 00346	50	3800	0 0

11795

11695 **Trench T 6**

111 3

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Acetone	8	10	8	ug/kg	100	102000000	211000	
Acetone	3	7	8	ug/kg	100	102000000	211000	
bis(2 Ethylhexyl)phthalate	3	7	84	ug/kg	330	1970000		
bis(2 Ethylhexyl)phthalate	8	10	62	ug/kg	330	1970000		
Butylbenzylphthalate	8	10	43	ug/kg	330	147000000		
Methylene chloride	8	10	6	ug/kg	5	2530000	39500	
Methylene chloride	3	7	5	ug/kg	5	2530000	39500	
Phenol	8	10	410	ug/kg	330	613000000		
Phenol	3	7	140	ug/kg	330	613000000		

Rocky Fl ts Envi onmental Technology S t

Figure 3
Trench T-6
Analyte Detections
Above Background Levels

EXPLANATION

Boreholes

Trench Boundary

IHSS Boundary

DAT SOUR E BASE FEATURES:
Build ga, en ea, hydrograph roads and ther tru ras from 1994 aerial ly- er d ta apt red by EG&G RSL, Las Vegas.
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Datum NAD27

U S Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by

CH2MHILL

Prepared for

KAISER HILL

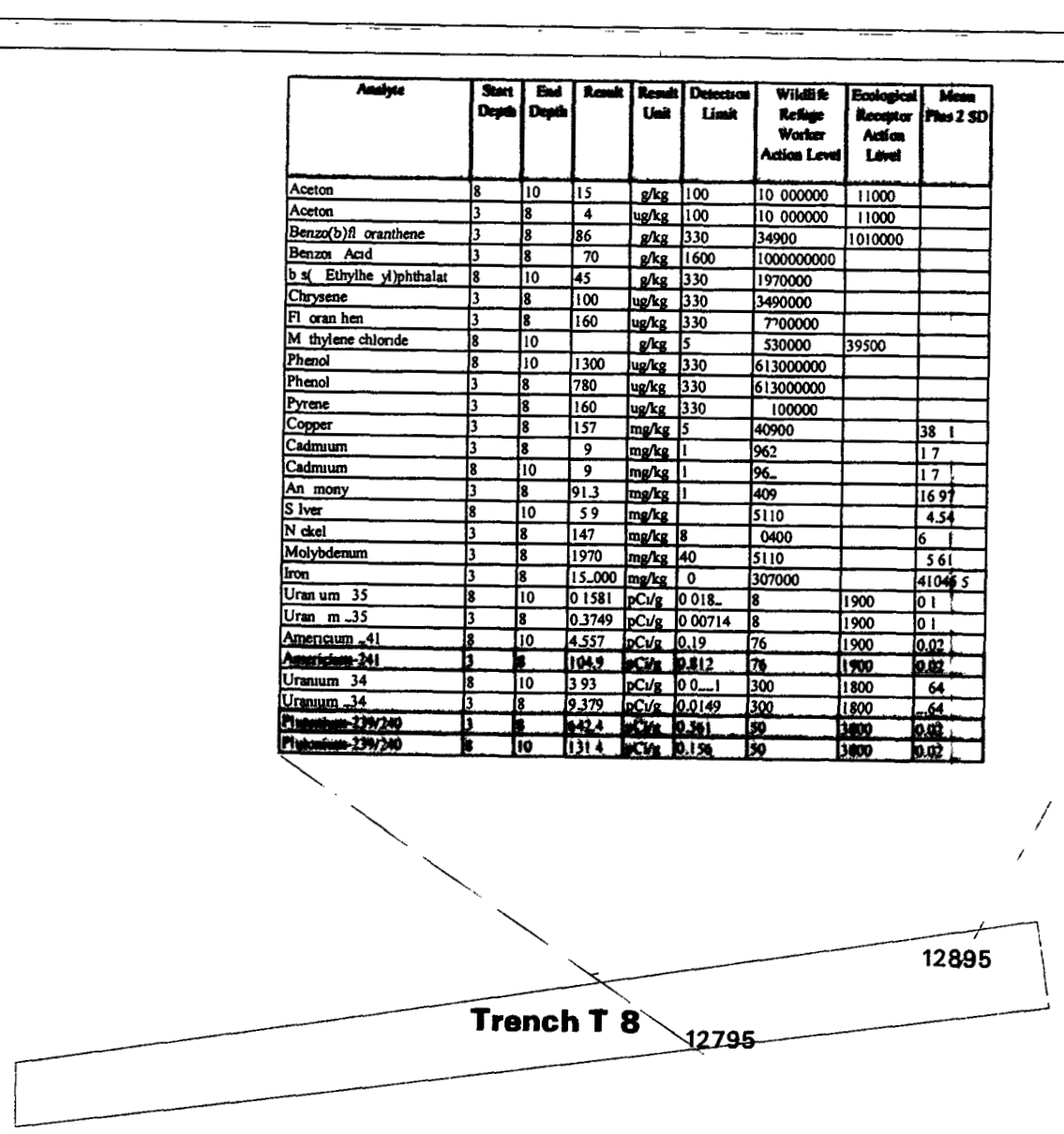
September 03, 2003

NT S /p j /hy2 03/03 476/ 2 h s ml

24

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Aceton	8	10	15	g/kg	100	10 000000	11000	
Aceton	3	8	4	ug/kg	100	10 000000	11000	
Benzo(b)fl oranthene	3	8	86	g/kg	330	34900	1010000	
Benzoi Acid	3	8	70	g/kg	1600	1000000000		
b s(Ethylhe yl)phthalat	8	10	45	g/kg	330	1970000		
Chrysene	3	8	100	ug/kg	330	3490000		
Fl oran hen	3	8	160	ug/kg	330	7*00000		
M thylene chlonde	8	10		g/kg	5	530000	39500	
Phenol	8	10	1300	ug/kg	330	613000000		
Phenol	3	8	780	ug/kg	330	613000000		
Pyrene	3	8	160	ug/kg	330	100000		
Copper	3	8	157	mg/kg	5	40900		38 1
Cadmium	3	8	9	mg/kg	1	962		1 7
Cadmium	8	10	9	mg/kg	1	96..		1 7
An mony	3	8	91.3	mg/kg	1	409		16 97
S lver	8	10	5 9	mg/kg		5110		4.54
N ckel	3	8	147	mg/kg	8	0400		6
Molybdenum	3	8	1970	mg/kg	40	5110		5 61
Iron	3	8	15..000	mg/kg	0	307000		41046 5
Uran um 35	8	10	0 1581	pCi/g	0 018..	8	1900	0 1
Uran m ..35	3	8	0.3749	pCi/g	0 00714	8	1900	0 1
Americium ..41	8	10	4.557	pCi/g	0.19	76	1900	0.02
Americium-241	3	8	104.9	pCi/g	0.812	76	1900	0.02
Uranium 34	8	10	3 93	pCi/g	0 0 ... 1	300	1800	64
Uranium ..34	3	8	9.379	pCi/g	0.0149	300	1800	..64
Plutonium-239/240	3	8	0.42 4	pCi/g	0.581	50	3800	0.02
Plutonium-239/240	8	10	131 4	pCi/g	0.158	50	3800	0.02

Analyt	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Ace one	3	8	9	ug/kg	100	10*000000	11000	
b s(Ethylhexyl)phthalat	8	10	59	ug/kg	330	1970000		
Methylene chlonde	3	8	1	ug/kg	5	530000	39500	-
Phenol	8	10	400	ug/kg	330	613000000	-	-
Phenol	3	8	60	ug/kg	330	613000000		-
Plutonium ..39/*40	3	8	0.07*71	pCi/g	0 0131	50	3800	0 02
Uran m-..34	8	10	3.493	pCi/g	0 0163	300	1800	..64
Uranium- 34	3	8	795	pCi/g	0 0246	300	1800	..64
Nickel	8	10	450	mg/kg	8	0400		62.21



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Rocky Fl t Environmental Technology Sit

Figure 4
Trench T-8
Analyte Detections
Above Background Levels

EXPLANATION

Boreholes

Trench Boundary

IHSC A RMER Boundary

DATA SOURCE BASE FEATURES:
Buildi gs, ences, hydrography, roads and ther tru res from 994 aerial ly-over d ta aptured by EG&G RSL, Las Vegas. Digi zed rom he orthophotographs. /95

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U S Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

Prepared by:
CH2MHILL

Prepared for:
KAISER HILL

September 04, 2003

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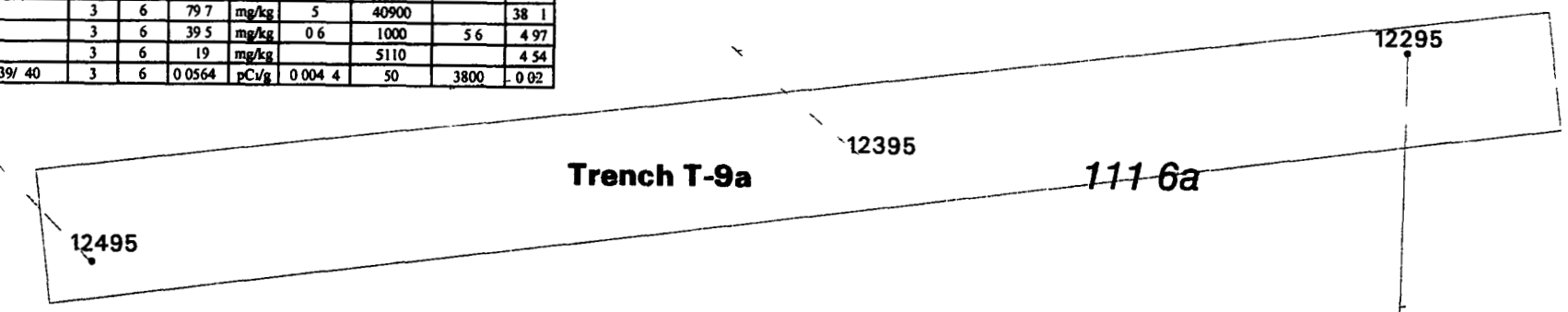
Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Butylbenzylphthalat	8	10	140	ug/kg	330	147000000		
Phen l	8	10	470	ug/kg	330	613000000		
Phenol	3	6	360	g/kg	330	613000000		
Zinc	3	6	143	mg/kg	4	307000		139 1
Cadm m	3	6	2 4	mg/kg	1	96		1 7
Copper	3	6	79 7	mg/kg	5	40900		38 1
Lead	3	6	39 5	mg/kg	0 6	1000	5 6	4 97
Silve	3	6	19	mg/kg		5110		4 54
Pluton um 39/ 40	3	6	0 0564	pCi/g	0 004 4	50	3800	0 02

Analyte	Start Depth	End Depth	Depth Unit	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
1,1,1 T chloroethane	3	8	FT	300	ug/kg	5	79700000		
Acetone	3	8	FT	1100	ug/kg	100	1 0 E+08	11000	
Butylbenzylphthal e	3	8	FT	4900	g/kg	330	1 47E+08		
Phenol	8	10	FT	700	g/kg	330	6 13E+08		
Phenol	3	8	FT	410	ug/kg	330	6 13E+08		
Tetrachloroethene	3	8	FT	16000	ug/kg	5	615000	37500	
T chloroethen	3	8	FT	190	ug/kg	5	19600	509000	
Pluton um _39/740	8	10	FT	0.0998	pCi/g	0 00954	50	3800	0 0
Amen um- 41	8	10	FT	0 0?19	pCi/g	0 00845	76	1900	0 0



Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
1 1,1 Trichloroethane	8	10		ug/kg	5	79700000		-
Acenaphthene	3	8	160	ug/kg	330	40800000		-
Acetone	3	8	18	ug/kg	100	102000000	11000	-
Acetone	8	10	16	ug/kg	100	102000000	11000	-
Anthracene	3	8	190	ug/kg	330	204000000		-
bis(Ethylhexyl)phthalate	8	10	1100	ug/kg	330	1970000		-
bis(-Ethylhexyl)phthalate	3	8	71000	ug/kg	330	1970000		-
Chloroform	8	10	2	ug/kg	5	19200	101000	
Chrysene	8	10	40	ug/kg	330	3490000		
Chrysene	3	8	370	ug/kg	330	3490000		-
Fluoranthene	3	8	430	ug/kg	330	27200000		-
Fluorene	3	8	1 0	ug/kg	330	40800000		
Methylene chloride	8	10	3	ug/kg	5	_530000	39500	-
Napthalene	3	8	110	ug/kg	330	3090000		-
Phenol	3	8	460	ug/kg	330	613000000		-
Phenol	8	10	1300	ug/kg	330	613000000	-	-
Pyrene	8	10	90	ug/kg	330	22100000	-	-
Pyrene	3	8	1200	ug/kg	330	22100000		-
Tetrachloroethene	8	10	50	ug/kg	5	615000	37500	-
Trichloroethen	8	10	130	ug/kg	5	19600	509000	-
Uranium-_35	3	8	0.3418	pCi/g	0.0111	8	1900	0.1
Uranium-234	3	8	9 615	pCi/g	0 0053	300	1800	2.64
Plutonium-239/240	3	8	0.08562	pCi/g	0.00362	50	3800	0.02
Uranium-238	3	8	10.26	pCi/g	0.0124	351	1600	1.49

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Figure 5
Trench T 9a
Analyte Detections
Above Background Levels

EXPLANATION

Boreholes

Trench Boundary

IHSS Boundary

DATA SOUR E BASE FE TURES:
Bu ding fen es, hydrography roads and ther ru res rom 1994 aerial ly ver d ap red by EG&G RSL, Las Vegas.
Digi zed rom h ph g aph 1/95

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GIS Dept. 303-966-7707

Prepared by

CH2MHILL

Prepared for

KAISER HILL

September 03, 2003

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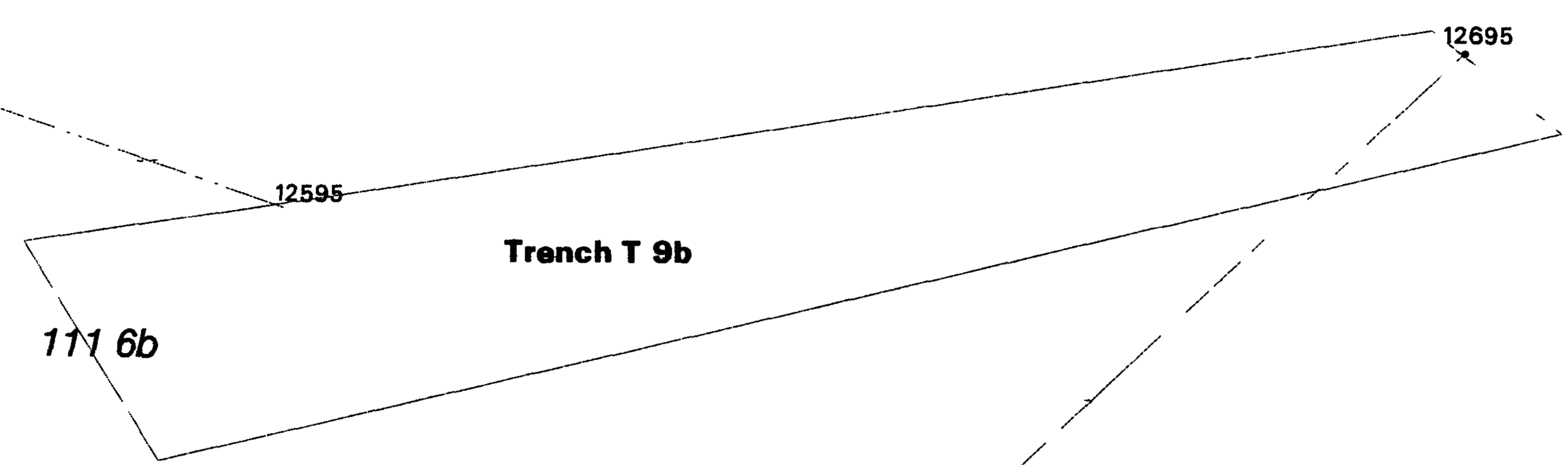
Rocky Fl ts Environmental Techn logy Sit

Figure 6
Trench T 9b
Analyte Detections Above Background Levels

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Act. Level	Ecological Receptor Action Level	Mean Plus 2 SD
Phenol	3	5	800	g/kg	330	613000000		
Phenol	8	10	760	ug/kg	330	613000000		
bis(2 Ethylhexyl)phthalat	8	10	67	g/kg	330	1970000		
bis(2 Ethylhexyl)phthalat	3	5	80	g/kg	330	1970000		
Aceton	8	10	6	g/kg	100	102000000	11000	
T hloroethene	8	10	1	ug/kg	5	19600	509000	
T hloroethene	3	5	5	g/kg	5	19600	509000	
D n-butylphthalate	3	5	50	g/kg	330	73700000		
Butylbenzylphthalat	3	5	85	g/kg	330	147000000		
Butylbenzylphthal	8	10	130	g/kg	330	147000000		



[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Butylbenzylphthalat	8	10	140	ug/kg	330	147000000		
Butylbenzylphthalat	3	6.5	81	ug/kg	330	147000000		
Nickel	8	10	116	mg/kg	8	20400		62.21
Phenol	3	6.5	1100	ug/kg	330	613000000		
Phenol	8	10	770	ug/kg	330	613000000		
bis(2 Ethylhexyl)phthalat	3	6.5	180	ug/kg	330	1970000		

EXPLANATION

Boreholes

Trench Boundary

IHSS Boundary

DATA SOURCE BASE FEATURES.
Building fences, hydrography road and other structures from 1994 aerial fly over dat aptured by EG&G RSL, Las Vegas.
Digitized from he orthophotographs. 1/95

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GIS Dept. 303-966-7707

Prepared by CH2MHILL

Prepared for KAISER-HILL

September 03, 2003

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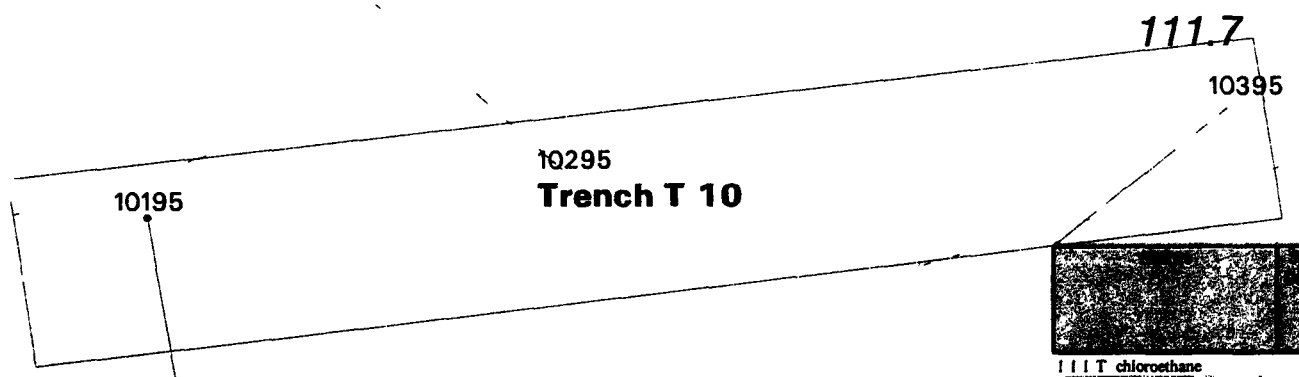
Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Aceton	3	5	_	ug/kg	100	10 000000	11000	
Aceton	8	10	1	ug/kg	100	10?000000	11000	
Benzo A d	8	10	88	ug/kg	1600	1000000000		
Benzo Acid	3	5	160	ug/kg	1600	1000000000		
b s(E hylhexyl)ph halat	3	5	35	ug/kg	330	1970000		
b s(Ethylhexyl)ph halat	8	10	55	ug/kg	330	1970000		
Butylbenzylphthalat	3	5	66	ug/kg	330	147000000		
Butylbenzylphthal	8	10	63	ug/kg	330	147000000		
Di b typh hal	3	5	45	ug/kg	330	73700000		
Di n-butyph halat	8	10	41	ug/kg	330	73700000		
Phenol	8	10	1700	ug/kg	330	613000000		
Phenol	3	5	750	ug/kg	330	613000000		
Tetrachloroethene	3	5	4	ug/kg	5	615000	37500	
Toluene	3	5		ug/kg	5	31300000	1 8000	
Lead	3	5	28...	mg/kg	0.6	1000	_5.6	24 97
Pluton um 39/?40	3	5	0 1191	pCi/g	0 00 5	50	3800	0 0_

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
4-Chloro-3 M hlyphenol	17	18	170	g/kg	660			
Aceton	3	5	19	ug/kg	100	10 000000	11000	
Ace on	17	18	1	g/kg	100	10 000000	11000	
Aceton	18	0	8	ug/kg	100	10 000000	11000	
b (? E hylh yl)phthal	17	18	36	ug/kg	330	1970000		
Butylbenzylphth l	17	18	47	g/kg	330	147000000		
B tylbenzylphth l	8	10	1300	ug/kg	330	147000000		
Butylbenzylphth l	3	5	3000	ug/kg	330	147000000		
D hylphthalat	3	5	56	g/kg	330	590000000		
Di-n-butylph halat	8	10	83	ug/kg	330	73700000		
M thylen chloride	3	5	41	g/kg	5	530000	39500	
M thylen chloride	18	0		g/kg	5	_530000	39500	
M thylen chlorid	17	18		ug/kg	5	_530000	39500	
T luene	3	5		ug/kg	5	31300000	1 8000	
T chloroe hen	3	5	11	ug/kg	5	19600	509000	
Arsen	8	10	15 9	mg/kg			1 6	13 14
Plutonium- 39/?40	17	18	0 03888	pCi/g	0 0409	50	3800	0 0



Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
Acetone	5	7	16	ug/kg	100	10?000000	11000	
Acetone	7	9	14	ug/kg	100	102000000	11000	
Benzoic Acid	5	7	300	ug/kg	1600	1000000000		
Benzoi Acid	7	9	260	ug/kg	1600	1000000000		
bis(2-Ethylhexyl)phthalate	5	7	120	ug/kg	330	1970000		
bis(2 Ethylhexyl)phthalate	7	9	48	ug/kg	330	1970000		
Butylbenzylphthalate	5	7	55	ug/kg	330	147000000		
Butylbenzylphthalate	7	9	6_	ug/kg	330	147000000		
Di-n-butylphthalate	5	7	45	ug/kg	330	73700000		
Methylene chloride	7	9	5	ug/kg	5	530000	39500	
Methylene chloride	5	7	4	ug/kg	5	530000	39500	
Phenol	5	7	1000	ug/kg	330	613000000		
Phenol	7	9	1500	ug/kg	330	613000000		
Americium-241	5	7	7 67	pCi/g	0 0195	76	1900	0.02
Plutonium-_39/?40	5	7	34 79	pCi/g	0 029	50	3800	0.0?
Uranium-_38	5	7	2.668	pCi/g	0 081	351	1600	1 49

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
1 1 1 T chloroethane	4	7	7	ug/kg	5	79700000		
Acetone	7	9	48	ug/kg	100	10?000000	11000	
Aceton	4	7	8	ug/kg	100	10 000000	11000	
Benzo( )anthracen	7	9	1700	ug/kg	330	34900	800000	
Benzo( )anthracen	7	9	1800	ug/kg	330	34900	800000	
Benzo( )anthracen	4	7	1000	ug/kg	330	34900	800000	
Benzo( )pyren	4	7	11000	ug/kg	330	3490	5700	
Benzo(a)pyren	7	9	6500	ug/kg	330	3490	5700	
Benzo(a)pyrene	7	9	4900	ug/kg	330	3490	5700	
Benzo(b)fluoranthen	4	7	2800	ug/kg	330	34900	1010000	
Benzo(g,h,i)perylen	7	9	1400	ug/kg	330			
Benzo(g,h,i)perylene	7	9	1900	ug/kg	330			
Benzo(g,h,)perylen	4	7	4600	ug/kg	330			
Carbon Tetrachloride	4	7	19	ug/kg	5	81500	83200	
Chloroform	4	7	5	ug/kg	5	19200	101000	
Chrysene	7	9	3400	ug/kg	330	3490000		
Chrysene	4	7	_300	ug/kg	330	3490000		
Chrysene	7	9	3200	ug/kg	330	3490000		
Fluoranthene	7	9	450	ug/kg	330	7200000		
Indeno(1,_,3-cd)pyrene	4	7	1100	ug/kg	330	34900		
Methylene chloride	7	9	7	ug/kg	5	530000	39500	
n-Nitrosodiphenylamm	7	9	870	ug/kg	330	7810000		
Phenanthrene	7	9	700	ug/kg	330			
Phenanthrene, _,3,5-trimethyl	7	9	10000	ug/kg				
Phenol	7	9	1300	ug/kg	330	613000000		
Phenol	4	7	2000	ug/kg	330	613000000		
Pyrene	7	9	6500	ug/kg	330	2100000		
Pyrene	7	9	12000	ug/kg	330	100000		
Pyrene	4	7	2800	ug/kg	330	100000		
Tetrachloroethene	4	7	410	ug/kg	5	615000	37500	
Toluene	4	7	10	ug/kg	5	31300000	1 8000	
Trichloroethane	4	7	4	ug/kg	5	19600	509000	
Americium-241	4	7	0.02015	pCi/g	0 0173	76	1900	0.02
Plutonium-_39/240	7	9	0.08608	pCi/g	0 00613	50	3800	0.0?

Rocky Fl ts Environmental Technology S t

Figure 7
Trench T 10
Analyte Detections Above Background Levels

EXPLANATION

Boreholes

Trench Boundary

IHSS Boundary

DATA SOURCE BASE FEATURES.
Bu d gs, en es, ydrography roads and er
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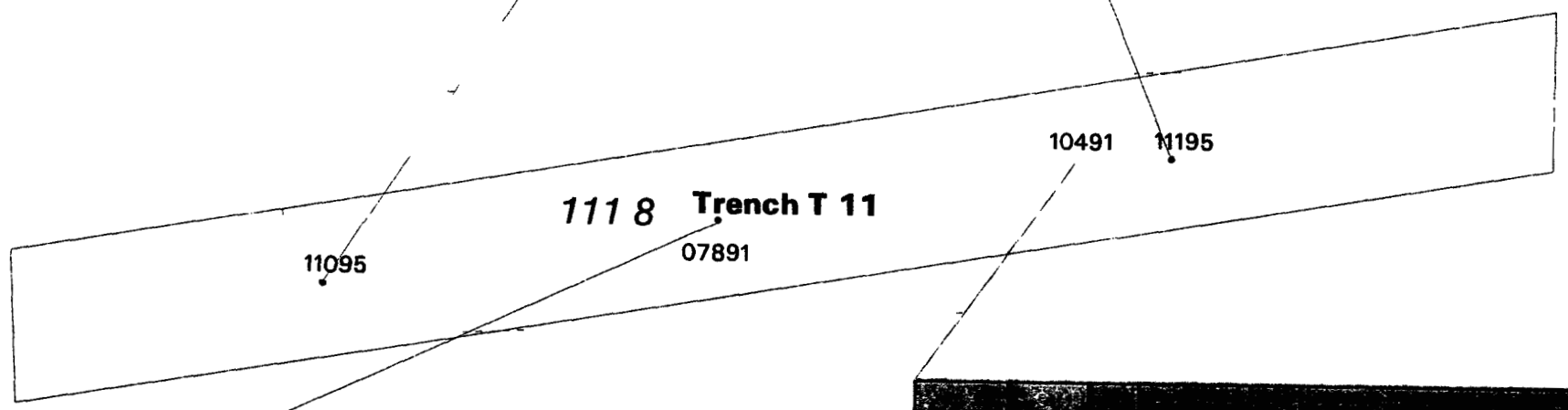
Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
1 Hexanol ethyl	7	10	8	ug/kg				
Aceton	3	5	8	g/kg	100	10 000000	11000	
Acet	7	10	9	g/kg	100	10 000000	11000	
Benzoi Acid	3	5	30	ug/kg	1600	1000000000		
bis(Ethylhexyl)ph hal	7	10	67	g/kg	330	1970000		
b s(Ethylhexyl)phthal e	3	5	110	ug/kg	330	1970000		
Butylbenzylph hal	7	10	130	g/kg	330	147000000		
Butylbenzylph hal	3	5	80	ug/kg	330	147000000		
Di n-butylph hal	7	10	56	ug/kg	330	73700000		
Methyl ne chlond	3	5	6	g/kg	5	530000	39500	
Phenol	7	10	550	ug/kg	330	613000000		
Phen l	3	5	440	g/kg	330	613000000		
N ck i	7	10	163	mg/kg	8	0400		6 1
Pl ton um- 39/240	7	10	0 03716	pCi/g	0 00845	50	3800	0 0
Plutonium- 39/240	3	5	0 02 35	pCi/g	0 00864	50	3800	0 0

Analyte	Start Depth	End Depth	Result	Result Unit	Detection Limit	Wildlife Refuge Worker Action Level	Ecological Receptor Action Level	Mean Plus 2 SD
4-Methyl -penta on	4	7		ug/kg	50	16400000		
Aceton	4	7	17	ug/kg	100	10 000000	11000	
Aceton	4	7	..3	ug/kg	100	10 000000	11000	
Benzo Acid	4	7	6	ug/kg	1600	1000000000		
bis(Ethylhexyl)ph hal	4	7	71	ug/kg	330	1970000		
b s(Ethylhexyl)ph hal	4	7	81	g/kg	330	1970000		
Butylbenzylph hal	4	7	59	ug/kg	330	147000000		
Butylbenzylph hal	4	7	140	ug/kg	330	147000000		
Methylen chlond	4	7		ug/kg	5	530000	39500	
Phen l	4	7	70	ug/kg	330	613000000		
N ckel	4	7	105	mg/kg	8	0400		6... 1
Pl tonium 39/240	4	7	0 1676	pCi/g	0 0334	50	3800	0 0
Americium- 41	4	7	0 0456	pCi/g	0 00589	76	1900	0 0
Plutonium 39/340	4	7	0...63	pCi/g	0 011	50	3800	0 0
Americium- 41	4	7	0 0 883	pCi/g	0 00665	76	1900	0 0



bis(?-Ethylhe yl)phthalat	16	...	47		330	1970000		
Toluene	.8	3			5	31300000	1..8000	
Pl tonium-..39/240	16	...	0 0344	0		50	3800	0 0?
Americium- 41	1	8	0.04939	0		76	1900	0 0?
Pl tonium-..39/?40	..1	8	0...528	0		50	3800	0.0..
Pl tonium-..39/240	8	14	0.03387	0		50	3800	0 0?

1,...-Dichloroethene (otal)	31 8	3	2	ug/kg	5	9200000		
Carbon Tetrachlonde	31 8	32	3	g/kg	5	81500	83200	
Chloroform	31 8	32		ug/kg	5	19200	101000	
Diethylphthalate	3	38	160	ug/kg	330	5900000000		
Tetrachloroethene	31 8	32	4	ug/kg	5	615000	37500	
Tetrachloroethene	10 6	10.8	4	ug/kg	5	615000	37500	
Toluen	16 8	17	17	ug/kg	5	31300000	1..8000	
Toluen	19	19...	20	ug/kg	5	31300000	128000	
Toluene	10 6	10.8	6	ug/kg	5	31300000	1..8000	
Toluen	43 8	44	610	ug/kg	5	31300000	128000	
Pluton um-239/?40	14	?0	0 03401	pCi/g	0 011	50	3800	0 0?
Americium- 41		8	0 02681	pCi/g	0	76	1900	0 0?
Pluton um-239/?40		8	0 03104	pCi/g	0 01	50	3800	0 0?
Radium ..28	8	14	...044	pCi/g	0.5			.04
Americium-..41	8	14	0 02058	pCi/g	0	76	1900	0 0?

Rocky Flats Environmental Technology Sit

Figure 8
Trench T 11
Analyte Detections Above Background Levels

EXPLANATION

- Boreholes
- Trench Boundary
- IHSS Boundary

DATA SOURCE BASE FEATURES
Buildings, fences, hydrography road and her structures from 1994 aerial fly-over dat aptured by EG&G RSL, Las Vegas. Digitzed from he orthopho ographs. 1/95

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GIS Dept. 303-966-7707

Prepared by:
CH2MHILL

Prepared for:
KAISER HILL

September 03, 2003

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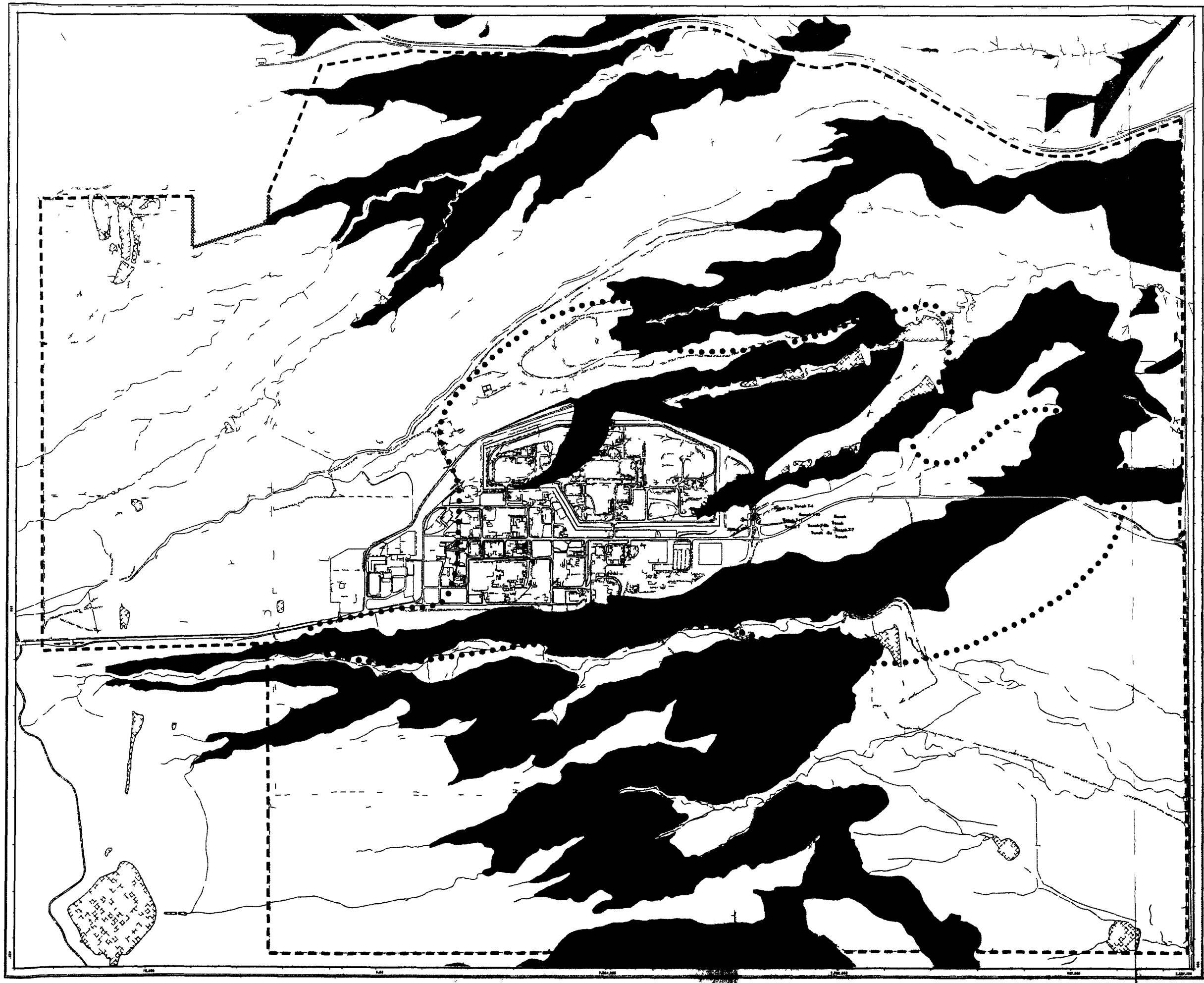

Figure 9

Area of Landslides and High Erosion Potential

EXPLANATION

East Trenches

Areas of landslides and high erosion Contaminated sites within these areas must be evaluated per Risk Screen 2 of Figure 3

The anticipated boundary of areas that will be subject to institutional controls is subject to modification based upon characterization future response actions the results of the comprehensive risk assessment and the final remedial/corrective action decision in the final CAD/ROD See Section 1 2

Approximately 25 acres identified as proposed Wind Technology Expansion Area in Rocky Flats National Wildlife Refuge Act 2001

Standard Map Features

Lakes nd ponds

St m d t h s th dr nage f tures

Fe es and other ba ier

Rocky Fl ts Enviro m ntal Techn logy Site boundary

Pa ed ads

Dirt ds

NOTES

R f nc

1 R p rt So l E si d S rf Wate Sed m t Tra sport M del g fo he Act de M gra o E alua io he R ky Fla Env ro mental Tech logy S e (August 2000)

2 Geol g M pp g Shroba R R d C ra a PE Prel'm nary S rfi ial Geologic M p f he Rocky Fla Plant d Vic ity Jeff so d Bo lde C he Col rado U.S. Ge logical S rvey Open-File Rep 94-162 Sc le 1 6000 S te so rce f top b se se OFR 94-162 (m p)

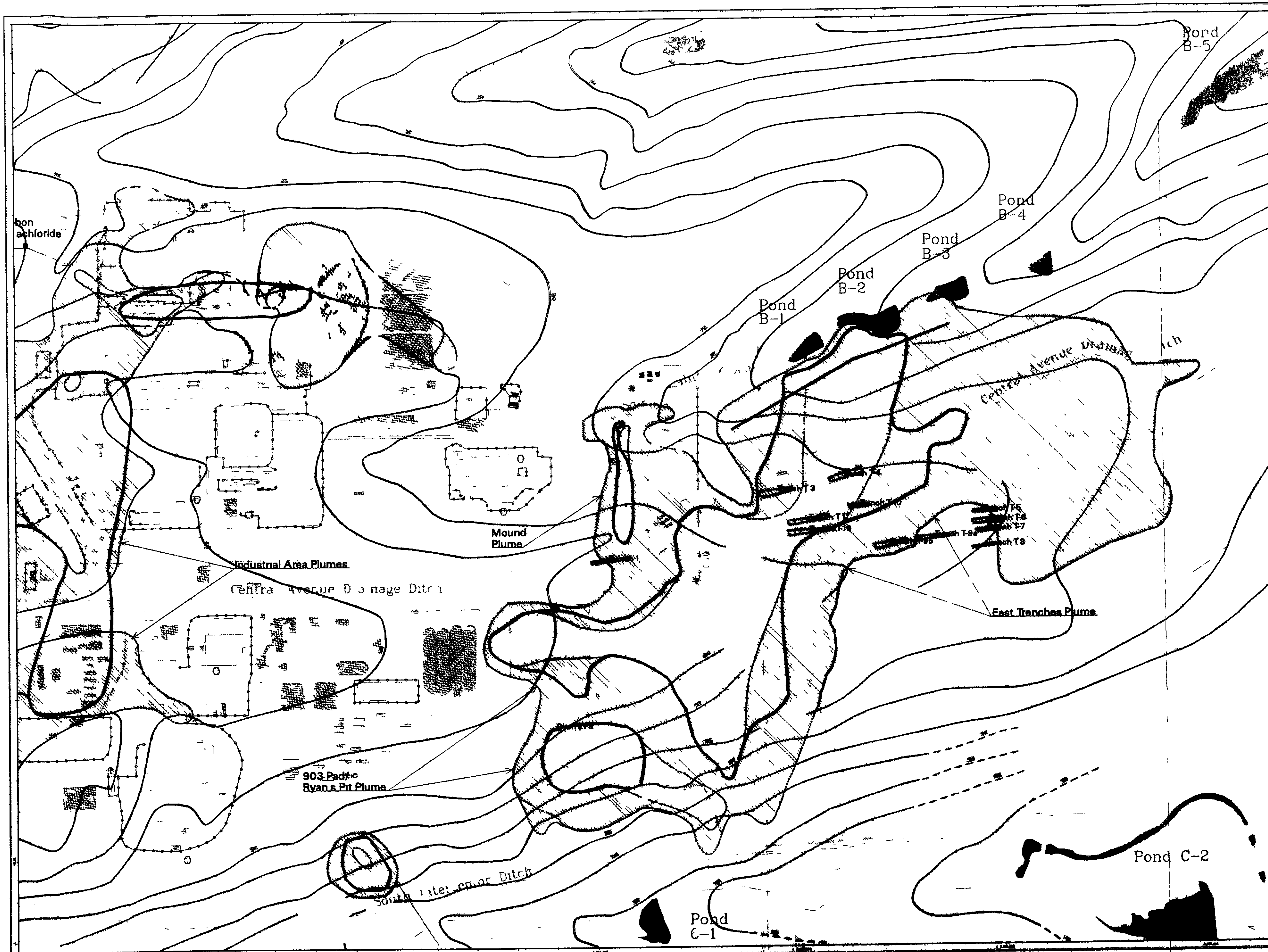

Figure 10
Composite VOC Plume and East Trenches Passive Reactive Barrier

EXPLANATION

Eas Trenc

Co le o System

2nd Quarte 2001 D ta W te Lev Co to (20 nterv)

Dashed where f rred

C rrent Compo ite Plume Key

Compo ite OC Grou dwater Plume (00 X MCL)

Composite VOC Gro ndwate Plume (nce ation equal to MCL)

Isolated occ rre c VOC exceeding T Actio Levels (1998-2002 D ta)

VOC Plume Extent (1998-200 D ta) (D shed where I ferred)

Histori Composite Plume Key

997 Composite VOC Gro ndwate Pl me (100 X MCL)

1997 Compos te VOC Gro ndwate Pl me (conce tio equal to MCL)

Standard M p Feature

Buildings and her tructures

Demolished buildings nd Other Structures

Lakes and ponds

treams, ditches, ther drainage features

Fences nd ther ba iers

Roads

Solar Evaporation Ponds (SEPs)

NOTES:

U. Department Energy
Rocky Flats Environmental echnology Site

Prepared by:

CH2MHILL

Prepared for:

3 plum 0 04 5 ml

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